

Course Unit Description - (LAMEC)

(Mechatronics Laboratory)

(Mestrado em Engenharia Electrotécnica e de Computadores)

Academic year: 2009/2010



Subject group: Automação e Robótica

Semestral Compulsory

Mode of study	Diurno	Hours/Week	T-Teórica	2
Year	2 ^o		PL-Prática-Laboratorial	2
Semester	1 ^o		OT-Orientação Tutorial	1

ECTS 6

Objectives

The main purpose of this class is to integrate different areas of knowledge covered during the course, through project and implementation of medium complexity systems. It is also an objective for this class, the development of the ability to research and search sources of information, technologies and products regarding the project under development. All of this process should be closely supervised through the introduction of methodologies of project engineering.

Course Contents

Project and implementation of industrial systems either presented to the students or proposed by their initiative, with teacher supervision.

These projects should use technologies and knowledge of one or several areas such as:

Embedded Systems

Real-Time Systems

Mobile Robotics

Industrial Communications (Ex. CAN) and high level associated protocols (CANKing, devicenet, CANopen, etc)

Project of digital systems based on microcontrollers (family PIC or '51) and use developing tools for the programming (integrating both assembler and 'C' languages), simulation and debug with hardware.

Project of digital systems using programmable logic devices (SPLD, CPLD or FPGA)

Recommended reading

Trevor Martin, "The Insiders Guide to the Philips ARM7-based Microcontrollers", Hitex (UK) LTD, Fev 2005. In www.hitex.co.uk/arm.

Jonathan Corbet, Alessandro Rubini and Greg Kroah-Hartman, "Linux Device Drivers", Third Edition, O'Reilly & Associates, Inc, 2005.

W. Stadler, "Introduction to Robotics & Mechatronics", McGraw-Hill, 1996

Mike Beach, Steffen Duffner, Irena & Olaf Pfeiffer, "C51 Primer" Hitex (UK) Ltd, 1996.

Wolfhard Lawrenz, "CAN System Engineering", Springer Verlag, 1997

"RTAI Beginners Guide: a comprehensive introduction to the Realtime Application Interface."

DIAPM RTAI Programming Guide 1.0

Jerry Epplin, "Linux as an Embedded Operating System", Embedded Systems Programming, Oct 97. Michael Barabanov, "A Linux-based Real-Time Operating System",

M.S. Thesis, New Mexico Institute of Tecnology, June 97.

Tom Shanley, Don Anderson, "ISA System Architecture", Addison-Wesley, 1995

Datasheets.

Teaching Methods

In begin of the semester a plan of the course will be presented to the students. This plan must be adapted by the students in order to include all necessary tasks for project development. This process will be closely supervised through the introduction of methodologies of project engineering.

Assessment methods

The assessment is based on the following components:

Developed work and final report (10 in 20)

Presentation (2 in 20)

Discussion (2 in 20)

Partial reports (4 in 20)

Student performance along the course (2 in 20)

	Name
Teacher responsible:	Lino Manuel Baptista Figueiredo (LBF)
Lecturer:	Lino Manuel Baptista Figueiredo (LBF)